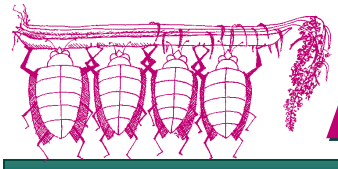
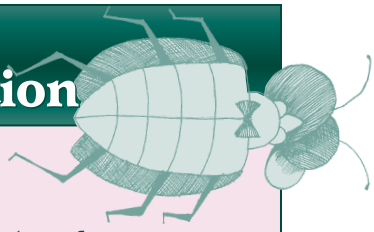


APPENDIX 7

Over-Wintering Beetles for Indoor Winter or Outdoor Spring Propagation



The best way to get *Galerucella* beetles for outdoor propagation is to collect them from small, successful field sites that you or others have previously established. Work is minimal and fecundity stays high, though timing is critical to collect them in sufficient numbers. Try to establish your own local insectory sites the first year you raise beetles and, in 1-3 years, you may have your own spring beetle supply.

You may also try keeping some *Galerucella* beetles captive over-winter from previous rearing efforts, for rearing beetles indoors in winter or outdoors in spring. Do this for only one year after starting with beetles collected from the field because fecundity soon drops. Also, results of captive over-wintering are quite variable with mortality of 20%-100% common, making it difficult to depend on retrieving live beetles. The Wisconsin DNR may make winter beetles available in the future if research shows that indoor-reared beetles establish well outdoors or if many teachers/cooperators want to try rearing entirely within the school year.

Start the previous spring by setting up several extra potted and netted plants. In summer, transfer up to 200 of your newly produced adults to each of these plants instead of releasing all the beetles into field sites. Three such plants with 200 beetles each should give you at least 100 beetles for the next year's propagation and hopefully many more. Captive beetles have to feed until September, so the plants must be big and healthy enough to withstand their feeding until then.

OUTDOOR METHOD

Simply allow the *Galerucella* beetles to over-winter outdoors on their new plants, either in their pool, covered with an inverted pool, or dug into the ground. These procedures help protect the beetles from the extremes of winter cold. Wait until the plants have died back to the ground before removing net cages and storing plants for the winter to be sure the beetles have fed adequately.

If using the pool method, either leave the nets on the pots or remove them when plants are ready, then bend or clip the old stems, add leaves for insulation and cover with another inverted pool, bolted to the first.

For pots dug into the ground, clip off the old stems when the plants are ready and place hardware cloth on top of the pots to protect plant roots and beetles from rodents. Dig a hole for each pot, place it into the hole and fill in around it with leaves and soil. Insulate the pot and beetles by heaping leaves or other insulation (but no straw) over the top, especially if winter snow cover is variable.

In the spring as soon as thawing starts, uncover pools and place all pots back into them, replacing net cages if previously removed. Pot new plant roots as early as possible from either roots harvested in the fall or dug immediately when your nearby wetland thaws so they are ready when your beetles emerge. This is especially important for captive, over-wintered beetles because they will emerge earlier than those in the wild. Collect any emerging *Galerucella* beetles and transfer them carefully to the newly dug, potted and netted plants.

Appendix 7.

REFRIGERATOR METHOD

Beetles may also be over-wintered in the artificial cold of a refrigerator, as long as they are given a place to hide and not allowed to desiccate. One method is to make up several small bundles of 6" pieces of dry loosestrife stems tied together with string. Place each in a freezer bag with a piece of floral foam moistened with just as much distilled water as it will hold without dripping into the bag. Excess water can encourage condensation and harmful mold formation, but *Galerucella* beetles seem to tolerate some of this and desiccation is the more serious problem. Double bagging may reduce condensation and mold formation, as well as desiccation.

Transfer beetles when they have ceased feeding on their summer holding plants to the refrigerator bags, usually in mid-September. If collected too early, the beetles may not put on an adequate reserve of winter fat; if too late, the beetles will have moved into the soil to over-winter and be hard to find.

Place 50-100 *Galerucella* beetles in each bag and allow at least an hour for them to find hiding places in the stems. Try to simulate as gradual a temperature drop as possible before placing the bag(s) into a refrigerator, in order to avoid high mortality rates. Either take the temperature down gradually to close to freezing or place bags into the refrigerator for increasing periods of time. Remember that you are trying to imitate nature—the closer you can simulate the natural process, the more likely your beetles will survive.

Collect new purple loosestrife roots for winter rearing in the fall, and store them moist, either outdoors under a shaded tarp, or in a root cellar at or below 40° F. Bring them into a warm, well-lit growing environment around the end of January, pot them, cover with net cages, and place in a pool or tub with water. They should grow to about two feet within 4-6 weeks and be ready for your *Galerucella* beetles. Gauge when that will be and shortly before it, retrieve pots with beetles from storage, replace their net cages if previously removed, and slowly bring them up to indoor temperatures. Collect any emerging beetles and transfer them gently to the new, netted plants for rearing.

If retrieving beetles from the refrigerator, gradually raise their temperature as in nature. Use an aspirator or other very gentle method to place 10 on each new plant.